HTP-Control

High Temperature Process Control

Steel exiting a continuous caster at a Tata Steel plant

March 2013

Space lasers used to reduce emissions

Laser based technologies developed to assist the landing of Mars Rovers could soon be used to help reduce CO_2 and waste in Tata Steel making plants.

This cutting-edge technology will now be tested in the heart of a Tata Steel continuous casting plant.

As part of a collaborative research and development programme funded by the UK Technology Strategy Board, called the HTP-Control Project, Tata Steel is working with IS Instruments Ltd, University College London – Mullard Science Space Laboratory (MSSL) and the Centre for Process Innovation, Thermal Technologies Centre (CPI) to develop this ground-breaking technology.

If the tests are successful, the laser technology will help reduce wastage by spotting micro surface imperfections when steel is still at around 1,000˚C.

Traditional surface testing means steel is allowed to cool before manually checking by a trained operator if defects are found the material is diverted for 'surface rectification' using more energy and generating more emissions.

"The success of the project for Tata Steel would be the reduction of waste by improving and enhancing defect management. By automatically spotting surface defects material can be more efficiently routed to the next stages of processing. This saves costs of storage space and material movements, manual inspection, and also further energy and CO_2 savings", said Andrew Smith Knowledge Group Leader, Tata Steel R&D, Steel making and casting department, Teesside Technology Centre

The development and application of innovative technologies for on-line detection of defects in products is becoming a key competitive factor in the steel industry.

The HTP-Control Project is an industry focussed, collaborative R&D programme designed to address and identify savings associated with eliminating rework and waste materials associated with high grade steel manufacture in the UK.

Using the collective expertise of the consortium partners, the project will develop the innovative non-destructive laser based system to measure continuous "as cast" steel at temperatures around 1,000˚C for the detection and identification of process defects.

A prototype unit will be developed for installation and trial on an actual casting plant, operated by Tata Steel, to optimise the technology and quantify the actual commercial and environmental benefits.

The project seeks to increase the global competitiveness of the UK steel industry, enabling the manufacture of both existing and new products in a more ecologically sound manner, together with significant savings in energy, CO_2 footprint and manpower.

"This project aims to exploit Mars exploration technology for the benefit of climate change reduction and to assist with the regeneration of British industry", said Prof Muller, Head of Imaging at MSSL

Meanwhile Neville Slack of CPI Thermal Technologies Centre said: "This is an excellent example of technology originally developed for the space sector being transferred to the UK's process industry sector."

HTP-Control has the potential to realise significant savings to the continuous casting plant by reducing the amount of as-cast semi being diverted for surface rectification.

With the ability to map surface defects, significant savings can be made on storage, movement, manual inspection and most importantly energy and CO_2.

The technology has applications within other market sectors, for example process, energy, construction and materials, other metals and waste and reclamation.

-ends-

For more details contact Neville Slack on (01642) 442474 or neville.slack@uk-cpi.com

HTP-Control Project Partners:

Centre for Process Innovation

Tata Steel UK Ltd

IS Instruments Ltd

University College London

Notes to Editors

About Centre for Process Innovation

- The Centre for Process Innovation is a UK-based technology innovation centre and part of the High Value Manufacturing Catapult. It uses applied knowledge in science and engineering combined with state of the art facilities to enable its clients to develop, prove, prototype and scale up the next generation of products and processes.
- CPI provides assets and expertise for its customers to demonstrate the process and prove it is feasible before investing substantial amounts of money in capital equipment and training.
- CPI is home to the UK's National Centres for Printable Electronics and Industrial Biotechnology
- CPI employs over 200 staff across its three sites
- Companies work with CPI to:

    - Trial new approaches to designing and manufacturing products at reduced risk and cost;
    - Take new knowledge from Technology Readiness Level 3 towards Level 7-8;
    - Avoid capital investment until an unequivocal case can be made;
    - Leverage funding for medium to long term (and risky) R&D through collaboration with other companies on common, pre-competitive problems;
    - Carry out confidential, single company projects utilising the unique capabilities of CPI;
    - Secure access to public funding to support strategic but longer term R&D;
    - Get advice on the scope and opportunities for adopting new manufacturing technologies within a company;
    - Seek assistance in developing potential collaborations and partners.

About Tata Steel in Europe

The European operations of Tata Steel comprise Europe's second largest steel producer. With the main steelmaking operations in the UK and Netherlands, they supply steel and related services to the construction, automotive, packaging, lifting & excavating, energy & power, aerospace and other demanding markets worldwide. The combined Tata Steel Group is one of the world's largest steel producers, with an aggregate crude steel capacity of more than 28 million tonnes and approximately 81,000 employees across five continents.

The Technology Strategy Board is the UK's innovation agency, accelerating UK economic growth by stimulating and supporting business-led innovation.